

Red Planet Recycle Supervisor Meeting
Tuesday 22 November 2011 at 2.00pm
Alrick Building D/E

Minutes

Group Members Attending

Yassen Abbas (Y.A)	Gareth Herron (G.H)	Charlotte Raymond (C.R)
Jamie Cassels (J.C)	Sam Jones (S.J)	Samuel Walpole (S.W)
Malcolm Chambers (M.C)	Dylan Martin (D.M)	James Young (J.Y)
Scott Clark (S.C)	Bo Peng (B.P)	

Supervisors Attending

Dr Prashant Valluri	Dr Lev Sarkisov
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Apologies for Absence

Lois Doig (L.D)

Meeting Agenda

1. Presentation of findings
2. Questions for Lev and Prashant on these topics
3. Discussion and conclusions
4. Agreement on next steps
5. Split into sub-groups and assign new tasks
6. Appoint a new secretary
7. Questions for Lev and Prashant concerning next steps

Minutes

1 – Presentation of findings

The results of the allocated tasks were presented;

- Y.A and S.C discussed their findings on the consumption of resources
- M.C, J.C and C.R discussed their findings upon the geographical properties of mars
- G.H, B.P, S.W and J.Y discussed the findings on the recycling of resources

2 – Questions Raised

In response to questions raised Dr Sarkisov and Dr Valluri suggested several key guidelines;

General Comments

- Consistency in units throughout the project is essential
- In all presentations show units on the slides
- 3 Project Stages
 - Stage 1 – Initial payload with no recycle or use of Mars resources
 - Stage 2 – Initial payload with recycling of resources
 - Stage 3 – Initial payload with recycling of resources and use of Mars resources

Consumption of Resources

- Extra resources should be taken into account for accidents and delays. This will not affect the process though (as these are extra and not used in normal operation)
- Objective is for the crew to return in the same state that they left, so assume calorie requirement is the same as Earth, but include a tolerance.
- Assume an average metabolic load

Geographical Overview of Mars

- Long term considerations – Consider the role of elevation on pressure and gas concentrations
- Actual site location should be postponed until a sensitivity analysis can be undertaken
- Assume gravity is constant
- Save atmospheric resource use until Stage 3 of the design

Recycling of Resources

- Consider separating water recycle into two stages, with the second stage for potable water.
- Quantify material waste where possible (ie. Water filters) but don't spend too much time on this.
- Do not take the NASA diagram as the design for the project!! Use as a reference only!!
- Potential to perform size/benefit analysis later in the design process to determine optimal unit size
- Find a use for Methane if using the Sabatier Process.
- Don't account for the function of the life support system in the designs.
- Nitrogen can be assumed as a buffer gas which will only require top-up after the initial payload.

3 – Discussion and Conclusion

The findings were discussed and it was concluded that Stage 1 of the design had been accomplished.

4/5 – Next Steps and Sub-Groups

The next step for the project was proposed as investigating Stage 2 possibilities. The team was split into new sub-groups, each researching a specific recycle area identified. The groups decided were;

- Water Recycle – G.H + S.W
- Air Recycle – J.C + C.R
- Food Recycle – S.C + S.J
- Biomass Recycle – M.C + Y.A
- Waste Recycle – D.M + B.P
- Thermal Energy Recycle – J.Y + L.D

The task proposed for each group was to create a flow-chart for the assigned resource and identify and discuss possible processes which could be used for recycling purposes.

The team task proposed was to combine potential processes to create basic BFDs for the Mars station.

6 – New Position Holders

S.W was appointed as the chairman for the 29/11/2011 meeting.

J.C was appointed as the secretary for the 29/11/2011 meeting.

7 – Questions about new tasks

No questions concerning the new tasks assigned were raised during the meeting.